

Claims

1. Mold closing unit having an apparatus for automatically adapting to the mold height of injection molds (13) of variable height (a) measured in closing direction (s-s) for an injection molding machine for processing plastics materials and other plasticizable substances, having
 - a stationary mold carrier (10),
 - a movable mold carrier (11),
 - a closing device for moving the movable mold carrier (11) in the closing direction (s-s) towards the stationary mold carrier (10) and away from the stationary mold carrier (10),
 - an injection mold (13) of variable height (a) measured in the closing direction (s-s), said injection mold being accomodatable between the mold carriers (10, 11),
 - a supporting element (21) for the closing device,
 - a mold height adjustment (14) for adjusting the distance (x) between stationary mold carrier (10) and supporting element (21) by moving the supporting element,
 - a drive (15) for automatically adjusting the mold height adjustment (14),
 - a locking device (16) for locking the supporting element (21) in its respective position,characterized in that a release position is provided in the displacement region of the movable mold carrier (11), said release position effecting the unlocking of the locking device (16) when the movable mold carrier (11) is in the release position.
2. Mold closing unit according to claim 1, characterized in that the release position is externally of and at the end, which is remote from the stationary mold carrier (10), of the displacement region of the movable mold carrier (11), which displacement region is necessary during the actual injection molding process.
3. Mold closing unit according to claim 1 or 2, characterized in that the mold height adjustment (14) is disposed on the supporting element (21).

4. Mold closing unit according to one of the preceding claims, characterized in that the mold height adjustment (14) includes nuts (22, 23), which engage by means of threaded portions (17a) on guiding elements (17) for the supporting element (21) and are adjustable by means of the drive (15).
5. Mold closing unit according to one of the preceding claims, characterized in that at least two nuts (22, 23) in each case are clamped as a result of the effect of resilient means (18) of the locking device (16).
6. Mold closing unit according to one of the preceding claims, characterized in that the nuts (22, 23) abut against a clamping sleeve (25) and the supporting element (21), both of which are in operative connection through connecting means (26) mounted thereon and clamp the nuts (22, 23) under the effect of resilient means (18).
7. Mold closing unit according to one of the preceding claims, characterized in that the connecting means (26) are bolts which penetrate at least the supporting element (21), and in that spring washers in the form of resilient means (18) are mounted between the bolts and a clamping sleeve (24) and/or the supporting element.
8. Mold closing unit according to claim 7, characterized in that the bolts are secured with a screw (26a) to the clamping sleeve (25) and are mounted on the supporting element (21) by means of the resilient means (18).
9. Mold closing unit according to the preceding claims, characterized in that connecting means (26), which are mounted on the supporting element (21), project in the direction of the movable mold carrier (11) as far as into the region of the release position, and in that the movable mold carrier includes an actuating face (11a), which, in the release position of the movable mold carrier, actuates the connecting means (26) by lifting the locking effect of the resilient means (18).

10. Mold closing unit according to claim 9, characterized in that the actuating face (11a) is disposed in the region of a bore being in the form of a guiding for guiding the movable mold carrier along the guide elements (17), which are in the form of guide columns.

11. Method for automatically adapting the mold height of injection molds of variable height (a) measured in closing direction (s-s) on an injection molding machine for processing plastics materials and other plasticizable materials, having

- a stationary mold carrier (10),
- a movable mold carrier (11),
- a supporting element (21) for a closing device (20) for moving the movable mold carrier (10) towards the stationary mold carrier (11) and away from the stationary mold carrier (11),
- a mold height adjustment (14),
- a drive (15) for adjusting the mold height,
- a locking device (16) for locking the supporting element (21) in its respective position,

wherein the method includes the following steps:

- releasing the supporting element (21) from its position, which was coordinated with the previous mold height, by opening the locking device (16),
- changing the distance (x) between stationary mold carrier (10) and supporting element (21) by moving the supporting element (21) by means of the drive (15),
- securing the supporting element (21) in the changed position, which is coordinated with the new mold height, by locking the locking device (16).

characterized in that the movable mold carrier (11), in a release position for releasing the supporting element (21), unlocks the locking device (16).

12. Method according to claim 11, characterized in that the movable mold carrier (11) is transferred by means of its closing device (20) into a position for actuating the locking device (16).

13. Method according to claim 12, characterized in that the position at the end remote from the stationary mold carrier (10) is on the other side of the normal displacement region of the movable mold carrier (11) during the production process.
14. Method according to one of claims 11 to 13, characterized in that during the changing of the distance (a), supporting element (21) and movable mold carrier (11) are moved together.
15. Method according to one of claims 11 to 14, characterized in that, for changing the distance (a), the drive (15) actuates nuts (22, 23) and adjusts them along threaded portions (17a), which, in the secured condition, are checked by the locking device (16).
16. Method according to one of claims 11 to 15, characterized in that when the movable mold carrier (14) approaches the supporting element (21), it releases the resilient means (18) and lifts the checking effect between the nuts (22, 23).
17. Method according to one of claims 11 to 16, characterized in that, through the movement of the movable mold carrier (11) into the release position along the guide elements (17), the force for lifting the effect of the resilient means is introduced to the resilient means (18) in a substantially linear manner.